

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An aircraft weather radar display method comprising:
selecting a display distance value;
5 retrieving weather radar return information stored in a plane of voxels in a buffer based on the selected display distance value and aircraft position information; and
generating an image based on the retrieved weather radar return information.
2. The method of Claim 1, wherein the voxel plane associated with the retrieved
10 weather return information is perpendicular to the aircraft's heading.
3. The method of Claim 1, wherein the voxel plane associated with the retrieved weather return information is at a constant range from the aircraft.
4. The method of Claim 1, further comprising
selecting a display altitude range,
15 wherein retrieving radar return information is further based on the selected display altitude range
5. The method of Claim 1, wherein at least one of the selecting the display distance value or the display altitude range is performed by a user using a user interface device in the aircraft.
- 20 6. An aircraft weather radar display method comprising:
retrieving weather radar return information stored in a buffer based on a flight plan;
generating an image based on the retrieved weather return information; and
displaying the generated image.
- 25 7. The method of Claim 6, wherein the flight plan comprises a vertical profile with a plurality of segments.
8. The method of Claim 6, wherein retrieving weather radar return information comprises retrieving weather radar return information stored in a plurality of voxel planes that correspond to the plurality of segments of the vertical profile.
- 30 9. The method of Claim 8, wherein the generated image is a plan view image.

10. The method of Claim 6, wherein the flight plan comprises a directional profile with a plurality of segments.

11. The method of Claim 10, wherein retrieving weather radar return information comprises retrieving weather radar return information stored in a plurality of vertical columns that correspond to points along the plurality of segments of the directional profile.

12. The method of Claim 11, wherein the generated image is a vertical slice view image.

13. An aircraft weather radar display system comprising:

- a memory configured to store weather radar return information in a buffer;
- a processor coupled to the memory, the processor comprising:
 - a first component configured to receive a display distance value signal;
 - a second component configured to retrieve weather radar return information stored in a plane of voxels in the buffer based on the selected display distance value and aircraft position information; and
 - a third component configured to generate an image based on the retrieved weather radar return information; and
- a display device configured to display the generated image.

14. The system of Claim 13, wherein the voxel plane associated with the retrieved weather radar return information is perpendicular to the aircraft's heading.

15. The system of Claim 13, wherein the voxel plane associated with the retrieved weather radar return information is at a constant range from the aircraft.

16. The system of Claim 13, further comprising a user interface device coupled to the processor and configured to generate a display altitude range signal, wherein the second component retrieves radar return information further based on the selected display altitude range

17. The system of Claim 13, further comprising a user interface device coupled to the processor and configured to generate the display distance value signal.

18. An aircraft weather radar display system comprising:

- a memory configured to store weather radar return information in a buffer;
- a processor coupled to the memory, the processor comprising:
 - a first component configured to retrieve weather radar return information stored in a buffer based on a flight plan;

a second component configured to generate an image based on the
retrieved weather radar return information; and
a display device configured to display the generated image.

19. The system of Claim 18, wherein the flight plan is a vertical profile flight plan
5 with a plurality of segments.

20. The system of Claim 19, wherein the first component retrieves weather radar
return information weather radar return information stored in a plurality of voxel planes
that correspond to the plurality of segments of the vertical profile flight plan.

21. The system of Claim 18, wherein the generated image is a plan view image.

10 22. The system of Claim 18, wherein the flight plan is a directional profile flight
plan with a plurality of segments.

23. The system of Claim 22, wherein the first component retrieves weather radar
return information stored in a plurality of vertical columns that correspond to points along
the plurality of segments of the directional profile flight plan.

15 24. The system of Claim 23, wherein the generated image is a vertical slice view
image.

25. An aircraft weather radar display computer program product comprising:
a first component configured to store weather radar return information in a
buffer;
20 a second component configured to receive a display distance value signal;
a third component configured to retrieve weather radar return information
stored in a plane of voxels in the buffer based on the selected display
distance value and aircraft position information; and
a fourth component configured to generate an image based on the retrieved
25 weather radar return information.

26. The product of Claim 25, wherein the voxel plane associated with the retrieved
weather radar return information is perpendicular to the aircraft's heading.

27. The product of Claim 25, wherein the voxel plane associated with the retrieved
weather radar return information is at a constant range from the aircraft.

28. The product of Claim 25, further comprising a fifth component configured to generate a display altitude range signal, wherein the second component retrieves radar return information further based on the selected display altitude range

5 29. The product of Claim 25, further comprising a fifth component configured to generate the display distance value signal.

10 30. An aircraft weather radar display computer program product comprising:
a first component configured to store weather radar return information in a buffer;
a second component configured to retrieve weather radar return information stored in the buffer based on a flight plan; and
a third component configured to generate an image based on the retrieved weather radar return information

31. The product of Claim 30, wherein the flight plan is a vertical profile flight plan with a plurality of segments.

15 32. The product of Claim 31, wherein the second component retrieves weather radar return information weather radar return information stored in a plurality of voxel planes that correspond to the plurality of segments of the vertical profile flight plan.

33. The product of Claim 32, wherein the generated image is a plan view image.

20 34. The product of Claim 30, wherein the flight plan is a directional profile flight plan with a plurality of segments.

35. The product of Claim 34, wherein the second component retrieves weather radar return information stored in a plurality of vertical columns that correspond to points along the plurality of segments of the directional profile flight plan.

25 36. The product of Claim 35, wherein the generated image is a vertical slice view image.

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